EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	452613	R-2-(4-hydroxyphenoxy)propanoic acid.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:49
L2	4644	hydroquinone.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:49
L3	2995	L1 and L2	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:49
L4	2132337	mild reducing agent.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:50
L5	1979	L3 and L4	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:50
L6	214696	reaction.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:50
L7	655	L5 and L6	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:50
L8	666136	process.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:51
L9	334	L7 and L8	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:51
L10	452239	formamidine sulphinic acid.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:52
L11	334	L9 and L10	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2007/04/27 11:52
S1	12	"4532346"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 10:59

EAST Search History

S2	8	"4625053"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 11:06
S3	14	"4505753"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 11:10
S4	237	562/471	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 11:10
S5	564	560/61	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 11:10
S6	94	S4 and S5	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 16:09
S7	24401148	R-2-(4-hydroxyphenoxy)propanoic acid or a salt.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 16:10
S8	24400882	S-2-halopropanoic acid or a salt.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 16:12
S9	4504	hydroquinone.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 16:12
S10	21	quizalofop-P-ethyl.clm.	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/10/13 16:16
S11	12	"4532346"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:15
S12	472097	hydroxy phenoxy propanoates	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:15
S13	1767535	optically active	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:16
S14	234438	S12 and S13	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:16

EAST Search History

S15	17	"352168"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:18
S16	2038964	R-2-(4-hydroxyphenoxy)propanoic acid	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:19
S17	374607	S16 and S12	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:19
S18	60479	hydroquinone	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:20
S19	34371	S17 and S18	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:20
S20	3210155	reducing agent	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:20
S21	31450	S19 and S20	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:21
S22	166	quizalofop-P-ethyl	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:26
S23	125	S12 and S22	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:45
S24	2	"5334744"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 08:28
S25	95	haloxyfop-P-methyl	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:49
S26	447	fluazifop-P-butyl	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:54
S27	616	clodinafop	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:56

EAST Search History

S28	302	cyhalofop-butyl	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:57
S29	60479	hydroquinone	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 10:57
S30	8	S28 and S29	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 11:24
S31	5034748	process	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 11:24
S32	3	S30 and S31	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 11:24
S33	2	"6175018"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 12:21
S34	3	"5886209"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 13:00
S35	17	"352168"	US-PGPUB; USPAT; EPO; DERWENT	OR	ON	2006/12/15 13:01

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COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
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FILE LAST UPDATED: 26 Apr 2007  (20070426/ED)

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=> s hydroquinone
         46590 HYDROQUINONE
          2609 HYDROQUINONES
L1        47574 HYDROQUINONE
                (HYDROQUINONE OR HYDROQUINONES)

=> s 2-halopropanoic acid
       9130785 2
             7 HALOPROPANOIC
       4358759 ACID
       1570934 ACIDS
       4856038 ACID
                (ACID OR ACIDS)
L2           4 2-HALOPROPANOIC ACID
                (2(W)HALOPROPANOIC(W)ACID)

=> s L1 and L2
L3           1 L1 AND L2

=> s mild reducing agent
        119044 MILD
             4 MILDS
        119046 MILD
                (MILD OR MILDS)
        377670 REDUCING
             3 REDUCINGS
        377671 REDUCING
                (REDUCING OR REDUCINGS)
        840323 AGENT
       1223525 AGENTS
       1718821 AGENT
                (AGENT OR AGENTS)
L4         229 MILD REDUCING AGENT
                (MILD(W)REDUCING(W)AGENT)

=> s L3 and L4
L5           1 L3 AND L4
```

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=> d L5 1 all

L5   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2007 ACS on STN
AN   2005:409456  CAPLUS
DN   142:463452
ED   Entered STN:  13 May 2005
TI   Production process of optically pure 2-(4-hydroxyphenoxy)propionic acid
IN   Cleugh, Ernest Stephen
PA   Syngenta Limited, UK
SO   PCT Int. Appl., 10 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
IC   ICM  C07C051-367
     ICS  C07D213-64; C07C059-68
CC   25-17 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
     Section cross-reference(s): 5
FAN.CNT 1
     PATENT NO.           KIND   DATE        APPLICATION NO.         DATE
     ---------------      ----   --------    --------------------    --------
PI   WO 2005042460         A1    20050512    WO 2004-GB3497          20040816
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
             CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
             GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
             LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
             NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
             TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
             AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
             EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
             SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
             SN, TD, TG
     CA 2535039             A1    20050512    CA 2004-2535039         20040816
     EP 1670743             A1    20060621    EP 2004-768060          20040816
     EP 1670743             B1    20070214
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK
     CN 1852884             A     20061025    CN 2004-80026709        20040816
     BR 2004014925          A     20061107    BR 2004-14925           20040816
     AT 353868              T     20070315    AT 2004-768060          20040816
     JP 2007507478          T     20070329    JP 2006-530547          20040816
     US 2006270851          A1    20061130    US 2006-571863          20060314
PRAI GB 2003-22917          A     20030930
     WO 2004-GB3497         W     20040816
CLASS
 PATENT NO.        CLASS  PATENT FAMILY CLASSIFICATION CODES
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 WO 2005042460     ICM    C07C051-367
                   ICS    C07D213-64; C07C059-68
                   IPCI   C07C0051-367 [ICM,7]; C07C0051-347 [ICM,7,C*];
                          C07D0213-64 [ICS,7]; C07D0213-00 [ICS,7,C*];
                          C07C0059-68 [ICS,7]; C07C0059-00 [ICS,7,C*]
                   IPCR   C07C0051-347 [I,C*]; C07C0051-367 [I,A]; C07D0213-00
                          [I,C*]; C07D0213-643 [I,A]
                   ECLA   C07C051/367+59/68; C07D213/64B
 CA 2535039        IPCI   C07C0051-367 [I,A]; C07C0051-347 [I,C*]; C07C0059-68
                          [I,A]; C07C0059-00 [I,C*]; C07D0213-64 [I,A];
                          C07D0213-00 [I,C*]
                   IPCR   C07C0051-347 [I,C]; C07C0051-367 [I,A]; C07C0059-00
                          [I,C]; C07C0059-68 [I,A]; C07D0213-00 [I,C];
                          C07D0213-64 [I,A]; C07D0213-643 [I,A]
                   ECLA   C07C051/367+59/68; C07D213/64B
 EP 1670743        IPCI   C07C0051-347 [I,C]; C07C0059-00 [I,C]; C07D0213-00
                          [I,C]; C07C0051-367 [I,A]; C07C0059-68 [I,A];
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		C07D0213-64 [I,A]
	IPCR	C07D0213-643 [I,A]
	ECLA	C07C051/367+59/68; C07D213/64B
CN 1852884	IPCI	C07C0051-367 [I,A]; C07C0051-347 [I,C*]; C07D0213-64 [I,A]; C07D0213-00 [I,C*]; C07C0059-68 [I,A]; C07C0059-00 [I,C*]
BR 2004014925	IPCI	C07C0051-367 [ICS,7]; C07C0051-347 [ICS,7,C*]; C07C0059-68 [ICS,7]; C07C0059-00 [ICS,7,C*]; C07D0213-64 [ICS,7]; C07D0213-00 [ICS,7,C*]
	IPCR	C07C0051-347 [I,C*]; C07D0213-00 [I,C*]; C07C0051-367 [I,A]; C07D0213-643 [I,A]
	ECLA	C07C051/367+59/68; C07D213/64B
AT 353868	IPCI	C07C0051-367 [ICS,7]; C07C0051-347 [ICS,7,C*]; C07C0059-68 [ICS,7]; C07C0059-00 [ICS,7,C*]; C07D0213-64 [ICS,7]; C07D0213-00 [ICS,7,C*]
	IPCR	C07C0051-347 [I,C*]; C07D0213-00 [I,C*]; C07C0051-367 [I,A]; C07D0213-643 [I,A]
JP 2007507478	IPCI	C07C0051-367 [I,A]; C07C0051-347 [I,C*]; C07C0059-13 [I,A]; C07C0059-00 [I,C*]; C07B0053-00 [N,A]; C07B0061-00 [N,A]
	FTERM	4H006/AA02; 4H006/AC43; 4H006/AC81; 4H006/BA02; 4H006/BA35; 4H006/BA36; 4H006/BA50; 4H006/BA61; 4H006/BJ50; 4H006/BN30; 4H006/BP30; 4H006/BS10; 4H039/CA61; 4H039/CD10; 4H039/CD20
US 2006270851	IPCI	C07D0241-36 [I,A]; C07D0241-00 [I,C*]; C07D0263-52 [I,A]; C07D0263-00 [I,C*]; C07D0213-78 [I,A]; C07D0213-00 [I,C*]; C07C0069-76 [I,A]; C07C0069-00 [I,C*]
	NCL	544/353.000; 562/471.000; 560/061.000; 546/153.000; 546/302.000; 548/217.000
	ECLA	C07C051/367+59/68; C07D213/64B

OS CASREACT 142:463452

AB A process for producing optically pure (R)-2-(4-hydroxyphenoxy)propanoic acid (I) or a salt or ester thereof comprises reaction of hydroquinone or a salt thereof with a (S)-2-halopropanoic acid or a salt thereof in the presence of a mild reducing agent. This process prevents over-alkylation which gives bis(1-carboxyethoxy)benzene, and oxidation of hydroquinone which results in highly colored byproducts. The compound I is useful as an intermediate in making herbicidal products (e.g. quizalofop-P-Et and haloxyfop-P-methyl) in industrial scale. Thus, hydroquinone (574 g, 5.22 mol) was charged to a reaction flask followed by sodium bisulfite (5.74 g) and water (1,014 g). The mixture was stirred under N and heated to 50° and 47% sodium hydroxide solution (799.5 g, 9.39 mol) was added. The solution was heated to 65° and an aqueous solution of (S)-2-chloropropanoic acid sodium salt (544.4 g, 32.5% as the free acid, 1.63 mol) was added. The reaction mixture was held at 65° for 4 h to give the total reaction mass (2937.6 g) with I content of 8.60 %, equivalent to 252.5 g product or 85% yield. H2O (700 g) was added and the temperature adjusted to below 45°. H3PO4 (120 g) was added to adjust the pH to about 11 and then 98% sulfuric acid (250 g) was added to reduce the pH to 6,5-7.5, the temperature being controlled at 55° during these addns. The solution was then extracted with Me iso-Bu ketone to give a solution of hydroquinone in MiBK for use in the next cycle. The aqueous phase was then acidified to pH 2±0.2 using 98% H2SO4 and extracted with MiBK to give a solution of I which was washed with a solution of 155.5 g KOH and 2.15 g sodium bisulfite in 280 g H2O. The aqueous solution was acidified to pH 1 with 32% HCl, cooled to 20°, and filtered to give, after washing the solid with water, 62% I.

ST hydroxyphenoxypropionic acid prepn intermediate herbicide; hydroquinone halopropanoic acid etherification

IT Etherification
Herbicides
Reducing agents

(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

IT Phosphites
Sulfinic acids
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

IT 71283-80-2P 72619-32-0P, Haloxyfop-P-methyl 79241-46-6P 100646-51-3P 114420-56-3P, Clodinafop 122008-85-9P, Cyhalofop-butyl
RL: AGR (Agricultural use); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

IT 94050-90-5P, (R)-2-(4-Hydroxyphenoxy)propanoic acid
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

IT 123-31-9, Hydroquinone, reactions 29617-66-1, (S)-2-Chloropropanoic acid 74533-11-2, (S)-2-Chloropropanoic acid sodium salt
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

IT 50-81-7, L-Ascorbic acid, reactions 302-01-2, Hydrazine, reactions 7446-09-5, Sulfur dioxide, reactions 7631-90-5, Sodium bisulfite 14265-45-3, Sulfite 14265-45-3D, Sulfite, alkali metal 14844-07-6, Hydrosulfite 15181-46-1, Bisulfite 15181-46-1D, Bisulfite, Alkali metal 23134-05-6, Metabisulfite 62607-44-7, Sulfenic acid
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of optically pure 2-(4-hydroxyphenoxy)propionic acid as herbicide intermediate by etherification of hydroquinone with (S)-2-halopropanoic acid in presence of mild reducing agent)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Anon; ELECTRONIC PESTICIDE MANUAL 1999, P1
(2) Fujinawa, S; US 4625053 A 1986 CAPLUS
(3) Manuf de Prod Chim Purs; FR 763374 A 1934 CAPLUS
(4) Rehn, K; US 4532346 A 1985 CAPLUS
(5) Schurter, R; US 4505743 A 1985 CAPLUS

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